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(43) **Pub. Date: Sep. 26, 2019**(54) **EARBUD DEVICES WITH CAPACITIVE SENSORS**(71) Applicant: **Apple Inc.**, Cupertino, CA (US)(72) Inventors: **Saeed Mohammadi**, Sunnyvale, CA (US); **Tao Shui**, Cupertino, CA (US)(21) Appl. No.: **15/933,090**(22) Filed: **Mar. 22, 2018****Publication Classification**(51) **Int. Cl.**  
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(57)

**ABSTRACT**

An earbud may have a housing with an ear portion and an elongated out-of-ear portion that protrudes away from the ear portion. A speaker may be aligned with a speaker port in the ear portion and may emit sound for a user. Audio playback functions and other operations may be controlled using a controller in the earbud. The controller may gather capacitive sensor data and other data and may use this data in identifying an operating mode of the earbud. Using information such as whether the earbud is in an in-ear state or an out-of-ear state or other sensor data, the controller may take actions such as pausing or resuming audio playback or adjusting playback volume. The capacitive sensor data can be gathered using capacitive sensing electrodes located on the ear portion and the stalk portion of the earbud.

